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Greater Yellowstone Coalition

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November 3, 2009

Lisa Jackson, Administrator
Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

RE: Petition to add Phosphate Mines to the list of facilities subject to the Toxic Release Inventory program of the Emergency Planning and Community Right to Know Act

Dear Administrator Jackson:

Under § 553(e) of the Administrative Procedure Act, the Greater Yellowstone Coalition ("GYC") requests that the Environmental Protection Agency promulgate a rule adding phosphate mines to the list of facilities subject to the Toxic Release Inventory program. GYC is a 501(c)(3) non-profit organization dedicated to protecting the wildlands, wildlife, and other outstanding natural resources of the Greater Yellowstone Ecosystem. This ecosystem encompasses eighteen million acres, including Yellowstone and Grand Teton National Parks, six national forests, three national wildlife refuges, and approximately three million acres of private lands GYC has offices in Idaho, Wyoming, and Montana and more than 20,000 members and supporters nationwide.

On January 27, 2006, GYC submitted a similar petition to the EPA, requesting the inclusion of phosphate mining in the TRI program. EPA responded in a letter dated February 24, 2006, stating that the agency would, "subject to available resources," review the petition and assess whether to include phosphate mining in the TRI program. Three years have passed since this correspondence with no further word from the EPA. In the meantime, phosphate mining continues outside the purview of the TRI program and the selenium contamination problem in southeast Idaho worsens.

Phosphate mining has been responsible for the release of large quantities of selenium (Se) in Idaho annually. These releases if Se have had a deleterious effect on the environment resulting in selenosis deaths of livestock and high bioaccumulations in fish and other wildlife, prompting the Idaho Department of Health and Welfare to issue a fish consumption advisory and conduct several health consults based on selenium releases to the environment.

While the issue of selenium contamination has been ongoing locally for over decades, many people who live, work, and recreate in the region remain unaware of the danger those releases pose. Therefore the inclusion of phosphate mining in SIC code 1475 is needed and fulfills the intent of EPCRA in Toxic Release Reporting.

The Greater Yellowstone Coalition is confident that after your review you too will agree that Phosphate Rock Mining operations should be required to report releases of selenium to the environment. GYC requests that the EPA consider the attached petition in a timely manner.

Sincerely,

Marv Hoyt
Idaho Director

Katie Strong
Idaho Conservation and Legal Associate

Petition to add Phosphate Rock Mining to the list of facilities required to report releases of chemicals under Standard Industrial Classification Code 1475, or North American Industrial Classification System 212392

Submitted by the Greater Yellowstone Coalition

I. Introduction

Phosphate mining causes the release of large quantities of selenium in Idaho annually. These releases cause substantial environmental harm. In fact, the selenium concentrations found in the native rock in this region exceed the threshold to be considered a hazardous waste by as much as 12 times.[1] These high concentrations of selenium are released by phosphate mining, which "removes phosphate-rich beds and exposes carbon-rich waste rock to subaerial weathering."[2] When the selenium contained in the native rock is exposed to the atmosphere and surface and groundwater, it changes from a relatively insoluble form to the soluble form of selenite or selenate.[3] Surface and groundwater readily transport these forms of selenium to surrounding streams, contaminating the stream and surrounding environment with toxic concentrations of selenium.[4]

While phosphate mining—and the attendant selenium contamination of ground and surface water—has occurred from more than 30 phosphate mines in southeast Idaho for decades, many people who live, work, and recreate in the region remain unaware of the danger these releases pose. Inclusion of phosphate mining in the TRI program would help alleviate the current lack of information on selenium contamination in southeast Idaho and assist federal and state agencies in making decisions regarding regulations and the permitted scope of phosphate mining on federal lands.[5]

Congress enacted the Emergency Planning and Community Right to Know Act ("EPCRA") to ensure the public is informed about hazardous chemicals that may affect then in their environment and to allow the public to make more informed decisions.[6] EPCRA's reporting requirements encourage polluting industries to become better neighbors through chemical use reductions and mitigation measures. The Administrator may subject a new industry group to the TRI reporting requirements if "such action is warranted on the basis of toxicity of the toxic

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[1] Presser, T.S., Piper, D.Z., Bird, K.J., Skorupa, S.J., Hamilton, S.J., Detwiler, S.J., Huebner, M.A. The Phosphoria Formation: A Model for Forcasting Global Selenium Sources to the Environment., *Life Cycle of the Phosphoria Formation. From Deposition to the Post-Mining Environment.* Pg. 308. Edited by James R. Hein. 2004.

[2] *Id., citing* U.S. Department of Interior and U.S. Department of Agriculture, 1977 Final environmental impact statement: development of phosphate resources in southeastern Idaho, Vol. I, U.S. Government Printing Office, Washington, D.C., 429 pp

[3] *Id.* at 309.

[4] *Id.*

[5] *See* 42 U.S.C. § 11023(h) (purpose of the TRI is "to inform persons about releases of toxic chemicals to the environment; to assist governmental agencies, researchers, and other persons in the conduct of research and data gathering; to aid in the development of appropriate regulations, guidelines, and standards; and for other similar purposes."); *see also* 40 C.F.R. § 372.1 ("The information collected is intended to inform the general public and the communities surrounding covered facilities about releases of toxic chemicals, to assist research, to aid in the development of regulations, guidelines, and standards, and for other purposes.").

[6] *Id.*

chemical, proximity to other facilities that release toxic chemicals or to population centers, the history of releases of such chemical at such facility, or other such factors as ... appropriate."[7] Including the phosphate mining industry in the TRI program is warranted because of (1) the toxicity of selenium; (2) the close proximity of phosphate mines to one another in southeast Idaho; (3) a well-established history of releases; the value of the information to the public; and (4) the growing threat posed by continuing and accelerating levels of selenium contamination.

II. Toxicity of Selenium

Selenium is an essential micronutrient but becomes toxic with elevated exposure. For example, biochemical pathways are unable to distinguish selenium from sulfur. This has the effect of creating congenital defects, noted in the embryos of fish[8] and waterfowl eggs in the area of phosphate mines that exhibit selenium concentrations eight times the allowable amount for viability.[9] As has been well documented, selenium bioaccumulates in the food chain, leading to reproductive impairment in fish and aquatic birds.[10] Lemly notes "...a transition from no effect to complete reproductive failure can occur over a range of only a few _g/L (parts per billion) waterborne selenium (Figure 1). Thus, even slight increases can light the bioaccumulation fuse of the selenium time bomb and push it over the toxic threshold."[11] Selenium contamination affects both aquatic and terrestrial ecosystems.

A. Aquatic Ecosystems

Sampling of water, macrophytes, macroinvertebrates, and fish over the past twelve years indicates widespread and severe selenium contamination throughout aquatic ecosystems of the phosphate-mining region of southeast Idaho. The large amount of selenium released into the environment by phosphate mining operations poses significant risks to the Blackfoot River in Idaho and the upper Salt River in Wyoming. Between 1997 and 2003, thirty-one separate streams and rivers were sampled for selenium in the Blackfoot and Salt River drainages in the phosphate-mining field. Samples included water, sediment, aquatic plants, invertebrates, and fish. All except three streams exhibited a high percentage of samples exceeding the "levels of concern" published by the U.S. Department of Interior in 1998.[12]

The 2002 and 2008 §303(d) lists of impaired streams prepared by the Idaho Department of Environmental Quality demonstrate the increasing problem of selenium contamination in

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[7] 42 U.S.C. § 11023(b)(1)(B).

[8] Cumbie, P.M. and Van Horn, S.L. 1978. Selenium accumulation associated with fish mortality and reproductive failure.

[9] Presser, T.S., Piper, D.Z., Bird, K.J., Skorupa, S.J., Hamilton, S.J., Detwiler, S.J., Huebner, M.A. The Phosphoria Formation: A Model for Forcasting Global Selenium Sources to the Environment. *Life Cycle of the Phosphoria Formation: From Deposition to the Post-Mining Environment.* Pg 312. Edited by James R. Hein. 2004.

[10] A. Dennis Lemly, Selenium Impacts on Fish: An Insidious Time Bomb. United States Forest Service, Blacksburg, VA. Human and Ecological Risk Assessment: Vol. 5, No. 6, pp. 1139–1151 (1999).

[11] *Id.*

[12] U.S. Department of the Interior. 1998. Guidelines for interpretation of the biological effects of selected constituents in biota, water, and sediment. National Irrigation Water Quality Program Information Report No. 3, U.S. Department of Interior. Washington, D.C. Levels of concern are defined as follows: "...rarely produce discernable adverse effects but are elevated above typical background concentrations" whereas concentrations above these levels "...appear to produce adverse effects on some fish and wildlife."

southeast Idaho. In 2002, nine stream segments, totaling 61.75 miles, were listed as impaired due to selenium contamination (Table 1).[13]

Table 1. 2002 Selenium Impaired Streams.[14]

ID #	Name	Description	Miles
ID17040105SK009_02	Sage Creek	source to mouth	24
ID17040207SK010_04	Blackfoot River	confluence of Lanes and Diamond Creeks to	13.82
ID17040207SK013_02a	Chicken Creek		2.86
ID17040207SK013_03	Dry Valley Creek	source to mouth	4.98
ID17040207SK014_02	Maybe Creek	source to mouth	5.23
ID17040207SK015_03	Lower Spring Creek		1.5
ID17040207SK015_02b	Lower Mill Canyon		1.03
ID17040207SK015_02a	Upper Mill Canyon		2.44
ID17040207SK015_02	Spring Creek		5.89
Total			**61.75**

By 2009, the number of selenium-impaired streams jumped to twenty-two stream segments for a total of 163.21 miles. This number includes the entire upper Blackfoot River and more than ninety miles of its tributaries. In other terms, phosphate mining has contaminated nearly 40% of the perennial stream miles of the Upper Blackfoot River watershed with selenium (Table 2).[15]

Table 2. 2008 Selenium Impaired Streams.[16]

ID #	Name	Description	Miles
ID16010201BR022_02b	Upper Goergetown Creek[17]	headwaters to left hand fork	10.87
ID17040105SK009_02	Sage Creek	source to mouth	12.41
ID17040105SK009_02d	Pole Canyon Creek		3.6
ID17040105SK009_02e	South Fork Sage Creek		7.93
ID17040105SK009_03	Sage Creek	source to mouth	3.22
ID17040209SK010_02a	State Land Creek		9.07
ID17040207SK010_04	Blackfoot River	confluence of Lanes and Diamond Creeks to	13.82

[13] Principles and Policies for the 2002 Integrated (303(d)/305(b)) Report. Idaho Department of Environmental Quality. September 30, 2005.
[14] *Id.*
[15] Idaho Department of Environmental Quality Working Principles and Policies for the 2008 Integrated (303[d]/305[b]) Report. Boise, ID. May 22, 2009.
[16] *Id.*
[17] This steam segment was not assessed in 2002.

ID17040207SK010_05	Blackfoot River	confluence of Lanes and Diamond Creeks to	20.67
ID17040207SK012_02b	Goodheart Creek		7.54
ID17040207SK013_02a	Dry Valley Creek		6.43
ID17040207SK013_02b	Chicken Creek	tributary to Dry Valley Creek	2.86
ID17040207SK013_03	Dry Valley Creek	source to mouth	4.98
ID17040207SK014_02	Maybe Creek	source to mouth	5.23
ID17040207SK015_02	Spring Creek		5.89
ID17040207SK015_02a	Upper Mill Canyon		2.44
ID17040207SK015_02b	Lower Mill Canyon		1.03
ID17040207SK015_03	Lower Spring Creek		1.5
ID17040207SK022_02	Sheep Creek	headwaters and un-named tributaries	13.49
ID17040207SK022_03	Lower Sheep Creek		1.32
ID17040207SK022_03a	Middle Sheep Creek		3.53
ID17040207SK023_02	Angus Creek	Un-named tributaries	11.34
ID17040207SK023_02a	Rasmussen Creek		6.26
ID17040207SK023_02b	Upper Angus Creek		7.78
Total			**163.21**

This dramatic increase—more than double the length of impaired stream segments listed in 2002—indicates the pace and extent of the selenium contamination problem in southeast Idaho: in a mere 7 years, an additional 101.46 miles of stream became impaired due to selenium contamination caused by phosphate mining.

TRI reporting would arm the public with more accurate data for weighing the value of phosphate mining to the local community when compared to the rapid and extensive contamination of the region's rivers and streams. The importance of this information is highlighted by the dramatic effects toxic levels of selenium have on fish and aquatic ecosystems.

i. Effects on Fish

The impact of selenium on fish and other aquatic species, including amphibians, shore birds, and waterfowl, is well documented. A number of studies indicate that selenium toxicity in fish is most often manifested by reproductive failure. One prominent case study examined Belews Lake, a water body in North Carolina contaminated by selenium laden ash wastewater from a coal-fired power plant.[18] The lake originally contained twenty species of fish. Only two remained after the nine-year contamination period (1976-85). Reproductive failure resulting from toxic levels of selenium caused this extirpation of eighteen species. Because of the bioaccumulative nature of selenium, contaminated lake sediments at the bottom of the food chain continued to cause developmental abnormalities in the re-stocked young fish as late as 1996.[19] This ecological disaster resulted from waterborne selenium concentrations of 150-200 Se µg/L,

[18] Lemly (1999).
[19] *Id.*

far less than the concentrations of selenium in some streams in the vicinity of the phosphate mines of southeast Idaho. For example, in 2006 water samples taken from Pole Canyon Creek, a tributary of the Salt River, which drains part of the Smoky Canyon phosphate mine had selenium concentrations of 992 µg/L. In 2008, selenium concentrations in Pole Canyon Creek exploded, reaching a high of 6,230 µg/L. Selenium concentrations in Maybe Canyon Creek, a Blackfoot River tributary that drains the South Maybe Canyon Mine, have been measured as high as 1,140 µg/L Se.[20] East Mill Creek, which drains the North Maybe Canyon Mine, had waterborne selenium concentrations of 417µg/L Se in the spring of 2005[21], 515 µg/L in May 2006[22], and 570 µg/L in May 2007.[23] The ecological impacts of these extreme concentrations have been well documented. Most notably, the selenium contamination has extirpated all fish, including the once robust Yellowstone cutthroat trout population,[24] from Mill Creek below the North Maybe Canyon Mine. Trout have also been extirpated from Maybe Canyon Creek and Kendall Canyon Creek.[25]

Selenium reaches streams in the Blackfoot and Salt River watersheds via surface and groundwater flows. For example, meteoric water (rain and snowmelt) flush through numerous mine wastes dumps and "reclaimed" mining pits at J.R. Simplot Company's Smoky Canyon Mine, leaching selenium from the waste rock into the local aquifer. The water discharged into the area's springs and streams from these aquifers contains selenium concentrations well above the surface water standard. Hoopes Springs, which is more than 2.3 miles from one of the sources of selenium impacting it, now has selenium concentrations at historic highs of 35.5 µg/L.[26] South Sage Springs, which is even further away from the sources of selenium, now has concentrations ranging upward of 23.8 µg/L.[27] The issue of selenium contamination of surface waters from the Smoky Canyon Mine's waste dumps is not an isolated incident in southeast Idaho but occurs at all of the seventeen phosphate mines—which are also CERCLA sites—and likely occurs at some of the other nine historic phosphate mines.

Fish populations have been hard hit by this contamination. In 2007, during a coordinated collection and analysis of fish from streams in southeast Idaho, the Idaho Department of Fish and Game (IDFG) sampled fifteen stream sites, a consultant for the J.R. Simplot Company sampled

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[20] Hill, Sheryl. Aquatic Systems Biologist. Pocatello, Idaho. An Analysis of Selenium Concentrations in Water and Biological Tissue Samples Collected in the Upper Blackfoot River and Salt River Watersheds from 1997 to 2003., 2005.

[21] Weber, Frank. Research Triangle Institute, Research Triangle Park, NC. Technical Report. RTI Project No.:08973.002.009, May 19, 2005.

[22] Weber, Frank. Research Triangle Institute, Research Triangle Park, NC. Technical Report. RTI Project No.: 0208973.002.009, 6/19/06.

[23] Weber, Frank. Research Triangle Institute, Research Triangle Park, NC Technical Report. RTI Project No.: 0208973.002.009, 6/11/07.

[24] Letter dated August 5, 1980 from Russ Thurow, Idaho Department of Fish and Game, Soda Springs, ID, to Dean Grover, Soda Springs Ranger District, Caribou National Forest. "In 1979, we electrofished sections of Kendall, Mill, and Spring Creeks… In Mill Creek, we surveyed two sections and densities equaled 37 cutthroat and 24 cutthroat trout fry per 100 meters with(in) the U.S. Forest Service Boundary "

[25] 2002 Cutthroat Trout Fish Distribution Survey Report, Kendall Creek. USDA Forest Service, Caribou-Targhee National Forest. "No fish were captured."

[26] Newfields. 2008 Interim Effectiveness Monitoring Report Pole Canyon Removal Action Smoky Canyon Mine October 24, 2008. Table 6, 2008 Surface Water Monitoring Results

[27] *Id.* at Table 5, 2008 Sampling Results for Springs.

five streams, and GYC sampled nine sites.[28] A total of 339 trout and 93 sculpin were collected and analyzed for selenium. The results of the 2007 sampling show that trout taken from streams impacted by phosphate mining averaged 11.4 μg/g dry weight selenium, while sculpin collected from impacted streams averaged 14.5 μg/g dry weight selenium.[29] That concentration far exceeds the proposed EPA standard maximum of 7.91 μg/g Se whole body dry weight criterion to protect aquatic life.[30]

In 2005, 2006, and 2008, GYC also sampled trout, sculpin, dace, and shiners from a total of twenty-one streams, including most of the streams sampled in 2007.[31] The results were similar to those in the 2007 study reported by IDFG. However, several of the impacted streams had markedly higher average selenium concentrations in 2008. For example, Yellowstone cutthroat trout collected from the Angus Creek site in 2007 had an average of 6.09 μg/g dry weight selenium. In 2008, the average concentration jumped to 12.79 μg/g.

These concentrations bode ill for fish populations in southeast Idaho. In a 2007 publication, Van Kirk and Hill reviewed Yellowstone cutthroat trout populations and how selenium concentrations in streams in the Salt River and Blackfoot River in southeast Idaho might effect those populations.[32] Based on the analysis and other research on the effects of selenium on salmonids, the authors conclude:

(1) when survival of individuals is density-dependent, population-level response to toxicant exposure may be lower than predicted based on individual-level response,
(2) cutthroat trout populations will be protected at selenium concentrations not exceeding 7.0 μg/g, and
(3) environmental stochasticity can significantly affect the response of populations size to individual-level toxicity.[33]

Furthermore, Van Kirk and Hill hypothesize that when selenium concentrations in fish exceed 10.0 μg/g whole body dry weight population level effects can be expected.[34] Making a grim report even worse, the Van Kirk and Hill model underestimated effects of selenium on cutthroat trout populations because it included effects only on pre-winter juvenile growth and survival and not effects observed in numerous other life stages of warmwater fish that could also occur in trout. The authors acknowledge that population-level effects of selenium toxicity on cutthroat

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[28] Frank. Research Triangle Institute. Research Triangle Park, NC. Technical Report. RTI Project No.:0208973.002.009. January 15, 2008.
[29] IDFG report for 08 selenium protocol meeting.
[30] http://www.epa.gov/seleniumcriteria/questions.htm
[31] Weber, Frank. Research Triangle Institute, Research Triangle Park, NC Technical Report. RTI Project No.:08973.002.009. September 19, 2005, Weber. Frank. Research Triangle Institute, Research Triangle Park, NC. Technical Report. RTI Project No.:0208973.002.009. September 25, 2006; Weber; Steven McGeehan University of Idaho Analytical Sciences Laboratory Moscow, ID November 13, 2008.
[32] Van Kirk, R.W., Hill, S.L., Demographic model predicts trout population response to selenium based on individual-level toxicity, Ecol. Model. (2007), doi:10.1016/j.ecolmodel.2007.04.003
[33] *Id.*
[34] *Id.*

trout could be substantially greater than they have predicted if the winter stress syndrome observed by Lemly (1993b) also is experienced by salmonids.[35]

Most recently, research in southeast Idaho on captured wild, pre-spawn brown trout in the Smoky Canyon Mine area, where phosphate-mining activities have polluted surface waters with selenium, produced alarming results.[36] The researchers documented the reproductive success and viability of young in the captured trout and their eggs. The findings indicate survival of the eggs and young of brown trout substantially decreased—and the frequency and severity of fish deformities increased—when selenium concentrations reached 20 to 25 milligrams/kilogram dry weight ("mg/kg dw") in fish eggs.[37] Overall survival of the eggs and young fish consistently dropped to 30 percent or less at egg selenium concentrations above about 25 mg/kg dw.[38] The researchers calculated an "EC-20" selenium value for survival of eggs and newly hatched fish, meaning a concentration of selenium in fish eggs at which 20 percent of the test fish would not survive.[39] They determined that value to be 21.63 mg/kg dw in brown trout.[40] The researchers also calculated an EC-20 value for fish deformities caused by selenium, reflecting a selenium concentration that would cause a reduction of 20 percent in the sum fraction of normal fish observed compared to total fish observed in their studies.[41] They determined this value to be 21.7 mg/kg dw.[42] The researchers calculated that their EC-20 value for fish survival at an egg selenium concentration of 21.63 mg/kg dw in brown trout corresponded to a whole-body selenium concentration in maternal fish of 13.35 mg/kg dw. In other words, if a maternal brown trout has a whole-body selenium concentration of 13.35 mg/kg dw, then 20 percent of her eggs will be too damaged by selenium poisoning for the eggs or young fish to survive.[43]

The Brown Trout study included wild fish captured in selenium-contaminated streams in southeast Idaho. The study validates the extensive research published by Lemly, Hamilton, and others over the last several decades in respect to the deleterious effects selenium has on fish. Just as significantly, the study validates the Van Kirk model.

ii. Effects on other Aquatic Species and Species Dependent on Aquatic Habitats

Effects of selenium contamination are unfortunately not limited to fish. Recent studies document the dramatic impact on birds, invertebrates, and amphibians. For example, in 1999, Dr. Joseph Skorupa—one of the premier scientists and researchers in the field of selenium's effects on avian species—conducted a site visit to the Idaho phosphate mining region. He later reported:

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[35] *Id.*

[36] Newfields. 2009. Brown Trout Laboratory Reproduction Studies Conducted in Support of Development of a Site-Specific Selenium Criterion (hereinafter Brown Trout study). Included in Appendix C of these comments.

[37] Brown *Trout Study* at 26-27.

[38] *Id.* at 26.

[39] *Id.* at 31-32.

[40] *Id.*

[41] *Id.*

[42] *Id.*

[43] *Id.* at 33.

… the hottest sampling sites discovered during this brief survey of the Idaho phosphoria region were hotter than the hottest sampling sites discovered during approximately a decade of sampling across ten states for the NIWQP [National Irrigation Water Quality Program].

However, the potential for damage to avian populations depends not only on how contaminated (hot) a site is, but also on how attractive it is to breeding water birds. What made Kesterson Reservoir such a large scale catastrophy (sp) was that it was highly contaminated AND it attracted thousands of breeding water birds each spring. This brief survey did not discover any sites that were suspected of exposing inordinately high numbers of breeding water birds. Although this survey was not designed to census bird numbers, the authors gained a qualitative impression that none of the sites surveyed supported more than a few hundred breeding water birds, and most of the sites surveyed probably supported substantially fewer breeding water birds.[44]

Dr. Skorupa further noted "we managed to discover aquatic invertebrates with the highest level of selenium (788 ppm) ever reported from much more intensive and extensive sampling across the western U.S."[45]

GYC collected macrophyte and macroinvertebrate samples from 22 streams in the phosphate-mining region of southeast Idaho from 2005-2008.[46] This data mirrors or exceeds selenium values from samples data collected by other researchers between 1997 and 2003 (as summarized in Hill, 2005).[47] Clearly, a catastrophe similar to—but more toxic—to what happened at Belews Lake is occurring in southeast Idaho and the upper Salt River drainage in Wyoming.

The high concentrations of selenium have also impacted amphibians in southeast Idaho. Skorupa et al. (2002) collected three recently dead or dying tiger salamander larvae on June 21, 1999, from a pit lake at Gay Mine. There, the researchers observed at least 152 carcasses along the shoreline on the shallow end of the pit lake. Skorupa had the tails (skin, muscle, and bones) of the salamanders analyzed for selenium concentrations and found they contained 40, 68, and 52 _g/g dry weight selenium.[48] These high selenium concentrations indicate that the salamanders died from selenium poisoning.

A year later, Jeremy Shive conducted a survey of the Smoky Canyon Mine in Caribou County,

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[44] Skorupa, J.P., S. Detwiler, and R. Brassfield. 2002. Reconnaissance Survey of Selenium Water and Avian Eggs at Selected Sites Within the Phosphate Mining Region Near Soda Springs, Idaho. May - June 1999.
[45] Joe Skorupa, USFWS, in e-mail to Sheryl Hill. 9 June 2003.
[46] Weber, Frank. Research Triangle Institute, Research Triangle Park, NC. Technical Report. RTI Project No.:08973.002.009. September 19, 2005. Weber, Frank. Research Triangle Institute, Research Triangle Park, NC. Technical Report. RTI Project No.:0208973.002.009. September 25, 2006; Weber, Frank. Research Triangle Institute, Research Triangle Park, NC. Technical Report. RTI Project No.:0208973.002.009. 10/30/07; Steven McGeehan University of Idaho Analytical Sciences Laboratory Moscow, ID August 20, 2008.
[47] Hill, Sheryl. Aquatic Systems Biologist. Pocatello, Idaho. An Analysis of Selenium Concentrations in Water and Biological Tissue Samples Collected in the Upper Blackfoot River and Salt River Watersheds from 1997 to 2003. 2005.
[48] Unpublished data, Dr. Joe Skorupa, U.S. Fish & Wildlife Service, Washington D.C., personal communication.

1997—were afflicted following exposure to relatively low concentrations of selenium over an extended period. Six of the eight were euthanized.[56] In 1997, more than 120 sheep died at the Conda mine from eating selenium-contaminated vegetation.[57] In September of 1999, approximately 60 sheep died from selenium contaminated forage or water near the Stauffer mine.[58] In June 2001, approximately 160 sheep died from selenium-contaminated water downstream from the Conda mine.[59] Yet another 327 sheep died in May 2003 after grazing on a reclaimed overburden dump site near the Conda mine.[60] Most recently, on August 11, 2009, at least 18 head of cattle died from forage contaminated by selenium growing on the J.R. Simplot owned Lanes Creek phosphate mine.[61] All of the reclaimed waste piles had concentrations of selenium in the vegetation that far exceeded the 5mg/kg grazing recommendations.[62]

Thresholds for acute and chronic poisoning of grazing animals occurs "at numerous disturbed [reclaimed] sites" in the vicinity of the phosphate mines.[63] A 2004 study found elevated concentrations of selenium in vegetation at each sampled location, with mean tissue samples for legumes of 80mg/kg and grasses of 18 mg/kg.[64] The study also found "hot spots," with concentrations as high as 200 mg/kg. This level of contamination threatens grazing cattle, sheep, and wildlife with acute poisoning in just one day of grazing.[65] Some of these greater risk areas have been closed to grazing,[66] but high levels of selenium pervade local forage and water and are responsible for elevated selenium concentrations in local cattle. In fact, even 150 days after removed from the range, livestock exhibited selenium levels of 1.3mg/kg.

Consumption of excessive amounts of selenium by humans causes various adverse health effects, depending upon exposure. Acute symptoms of selenosis—caused by ingestion of very large quantities over a short period of time—include nausea, vomiting, diarrhea, and cardiovascular problems.[67] Chronic symptoms—caused by ingestion of smaller quantities over longer periods—include hair/nail loss and neurological problems.[68] The Agency for Toxic Substances and Disease Registry has established the chronic intake level at .005 mg/kg/day of selenium.[69] For a 165 lb. person this would be .375 mg a day. Little more than an 8-ounce steak per day from the above "depured" beef—animals removed from the range and moved to feedlots—would be at the chronic exposure level. While more than eight ounces of beef a day exceeds an average

[56] Montgomery Watson. 1998. Fall 1997 interim surface water survey report, Southeast Idaho Phosphate Resource Area Selenium Project. Prepared for the Idaho Mining Association Selenium Committee
[57] BLM video from 1997.
[58] Idaho State Journal. 12 Nov., 1999 Pocatello, Idaho
[59] Idaho State Journal. 6 Jun., 2001. Pocatello, Idaho.
[60] Caribou County Sun. 19 Jun., 2003. Soda Springs, Idaho
[61] Bruce Olenick, Regional Administrator, Idaho Dept. of Environmental Quality, August 13, 2009.
[62] Idaho Department of Environmental Quality.
[63] Mackowiak, C.L., Amacher, M.C., Hall, J.O., and Herring, J.R. Uptake of Selenium and other contaminant elements into plants and implications for Grazing Animals in Southeast Idaho., *Life Cycle of the Phosphoria Formation. From Deposition to the Post-Mining Environment.* Pg. 546. Edited by James R. Hein. 2004.
[64] *Id.*, at 527
[65] *Id.*, at 548.
[66] Idaho Department of Environmental Quality Area Wide Human Health and Ecological Risk Assessment and Related Memorandum. Rick Clegg. 2002.
[67] Agency for Toxic Substances and Disease Registry http://www.atsdr.cdc.gov/toxprofiles/tp92-2.pdf pg. 15
[68] *Id.*
[69] *Id.*, at A-3

level of consumption for most people, it does indicate that chronic exposure levels are possible for a large population, especially local ranchers given the level of contamination and various mediums of exposure. The toxicity of selenium, and the implication for human health risk, affects both domestic livestock and upland wildlife.

With concentrations this high, livestock slaughtered directly after coming in from pasture presents a human health risk.[70] Given the toxicity of selenium to domestic livestock, including phosphate mining in the TRI program would increase local awareness of the risk posed by phosphate mining to grazing livestock in these areas.

ii. Upland Wildlife and Human Health Advisories

Consumption of local wildlife also poses a potential hazard to human health. In 2000, the Idaho Dept. of Fish and Game took muscle and liver samples of harvested elk at game check stations. The elk taken within two miles of the mine sites exhibited muscle tissue selenium concentrations as high as .92 mg/kg and liver tissue at 13 mg/kg. Consumption of such "contaminated elk liver could [result] in adverse health effects like nausea."[71] On October 17, 2006, the Idaho Department of Health and Welfare (IDHW) cautioned hunters to limit consumption of elk in the phosphate-mining region of southeast Idaho due to elevated selenium concentrations.[72] IDHW stated:

> For hunters and/or family members with a body weight of 80 kg or 176 lb, estimated exposures to selenium from daily consumption of elk muscle (one 8-ounce meal per day) or consumption of up to two 10-ounce meals of elk liver within a two week period is unlikely to result in any adverse health effects. However, consumption of larger amounts of elk liver may result in exposure to selenium at levels that exceed health-based guidelines.[73]

In addition to the elk consumption advisory, the Idaho Department of Health and Welfare issued a fish consumption advisory for East Mill Creek because of selenium contamination. The Department advises against children under the age of seven eating more than four 4 ounce meals per month of Yellowstone cutthroat and brook trout from East Mill Creek. This advisory has been in place since 2002.[74]

The Idaho Department of Health and Welfare has not revisited this issue even though selenium contamination has spread to other streams since the data for the health assessments were

[70] Idaho Department of Health and Welfare. Health Consultation. Evaluation of Se in Beef, Elk, Sheep, and Fish. 27 June, 2001.
[71] *Id.*
[72] Idaho Department of Health and Welfare. NEWS RELEASE_Hunters Reminded to Limit Consumption of Elk Liver of Animals Harvested Near Phosphate Mines. October 17, 2006.
[73] Idaho Department of Health and Welfare, Agency for Toxic Substances and Disease Registry and Bureau of Community and Environmental Health, Division of Health, Evaluation of Selenium in Elk In the Southeast Idaho Phosphate Resource Area BANNOCK, BEAR LAKE, BINGHAM, AND CARIBOU COUNTIES IDAHO EPA Facility ID: IDN001002245 July 2006.
[74] Streams of the Upper Blackfoot Watershed Temporary Selenium Fish Advisory (2002), Idaho Fish Consumption Advisory Program, Idaho Department of Health and Welfare.

collected. Streams deemed "un-impacted" in 2001 for fish are now on the Idaho Dept. of Environmental Quality's 303 (d) list of impaired streams due to selenium contamination (See Table 2).[75] Moreover, another "un-impacted" fish sampled location in 2001, Kendall Creek, was electro-fished a year later by the Forest Service. The Forest Service did not find any fish even though the stream had historically contained healthy populations of trout.[76] Unfortunately, Kendall Creek is just one more now barren site due to possible selenium mine pollution. If the Idaho Department of Health and Welfare resumed data collection, it would likely issue consumption advisories for other streams in the Blackfoot and Salt River watersheds. However, the agency is unlikely to resume data collection given current economic pressure on state. Without information concerning selenium releases, those who are aware of the dangerous selenium issue are concerned that people who consume fish in the area will become ill and that more fish populations will disappear.

While not addressed by any official health advisory, the impacts of selenium to upland wildlife are not limited to elk. Lower elevation wetlands that receive the drainage from disturbed mine locations produce vegetation having more than 53 mg/kg Se.[77] This undoubtedly adversely affects wetland foragers such as moose and waterfowl, especially considering that symptoms of selenium toxicosis occurs in livestock consuming vegetation containing $\geq$3-5μg/g Se.[78] Unlike removal of domestic livestock, restricting wildlife from these highly contaminated areas is not feasible. Therefore, information regarding selenium releases into this ecosystem would benefit those consuming wild game. Given the toxicity of selenium to the environment—and the attendant health risk posed to humans—including phosphate mining in the TRI program would advance the purposes of EPCRA and protect human health in southeast Idaho.

III. The Phosphate Mines of southeast Idaho are in Close Proximity to One Another

Nearly half of the U.S. phosphate reserves lie in a central area where the states of Montana, Wyoming, Utah, and Idaho conjoin. Within these phosphate rock bearing formations ("Phosphoria"), selenium occurs naturally. The Meade Peak Member of the Phosphoria formation contains the highest concentrations.[79] Selenium, a listed § 313 toxic chemical,[80] is present in relatively insoluble forms within the formation itself but transforms into soluble form—selenite and/or selenate—when exposed to weathering and oxidation. The process of open pit phosphate mining produces both of these mobile forms of selenium. Open pit mining also leads to the mined materials expanding by as much as 30%; such waste rock is typically disposed of in external piles or waste dumps.[81] Water runoff and infiltration then carries

[75] *Id.*
[76] USDA Forest Service, Caribou-Targhee National Forest, 2002 Cutthroat Trout Fish Distribution Survey Report, Kendall Creek, 26 June, 2002.
[77] Mackowiak, C.L., Amacher, M.C., Hall, J.O., and Herring, J.R. Uptake of Selenium and other contaminant elements into plants and implications for Grazing Animals in Southeast Idaho. *Life Cycle of the Phosphoria Formation. From Deposition to the Post-Mining Environment.* Pg. 527 Edited by James R. Hein. 2004.
[78] *Id.* at 501.
[79] McKelvey, V.E., Strobell, J.D., and Slaughter, A.L. 1986. The Vanadiferous Zone of the Phosphoria Formation in western Wyoming and southeastern Idaho. US Geol. Surv., Prof. Paper, 1465
[80] 40 C.F.R. § 372.65.
[81] Verbal communication Bill Stout, Bureau of Land Management. 25 Oct. 2005. Pocatello, Idaho

selenium from these weathering mine wastes into the environment.[82] Contamination is particularly severe in southeast Idaho, where seeps discharging selenium from mine waste piles occur widely throughout the region's phosphate production area.[83] At least 28 active and inactive phosphate mines exist in southeast Idaho. Two of the area's watersheds, the Blackfoot and Salt River, currently have the highest density of phosphate mining use in Idaho, with eleven mines located within twenty-one miles of one another and a total surface disturbance area of almost twenty square miles.[84] Seventeen of these mine sites, including two of the active mines (Smoky Canyon and Dry Valley), are so contaminated by selenium that they are under CERCLA cleanup orders. The third active mine, Monsanto's South Rasmussen Ridge Mine, has been in almost constant violation of water quality regulations since 2002, just two years after the mine was permitted.[85] Just as alarming is that one of the mining companies responsible for selenium contamination, Nu-West Industries, Inc., recently sued the federal government, asking that the American taxpayer pay for all costs associated with cleanup at four of its mine sites that are under CERCLA cleanup orders.[86] Continued mining in the region in such a concentrated manner ensures the selenium problem will continue as a human and ecological hazard in southeast Idaho. Increased public awareness, through TRI reporting, is warranted.

IV. Phosphate Mining Facilities have a Well-Established "History of Releases"

A "history of releases" by phosphate mining facilities is well established. For example, the Smokey Canyon mine Final Environmental Impact Statement ("EIS") of 1982 outlines an annual water quality testing procedure that includes selenium as one of the test criteria. The water quality-monitoring program, testing ten locations on five local creeks, was designed to alert the agencies involved of any developing water quality problems of this mine.[87] Analysis of surface mine waste exceeded EPA water quality standards in 1980 In other words, problems with selenium contamination were known at least twenty-five years ago.

Pole Canyon—the dumpsite for the initial phases of mining at the Smoky Canyon Mine–was filled with approximately 30 million cubic yards mine overburden between 1985-1990. As early as 1987, water quality samples taken from Pole Canyon Creek below the dump were in excess of Idaho standards for surface water.[88] By 1993, selenium concentrations at Pole Canyon Creek were measured at 170 µg/L, more than three times the drinking water standard, 34 times more than the Idaho standard for surface water, and remarkably higher than that same stream's control

[82] Desborough, G., E. De Witt, J. Jones, A. Meier, and G. Meeker. 1999. Preliminary Mineralogical and Chemical Studies Related to the Potential Mobility of Selenium and Associated Elements in Phosphoria Formation Strata, Southeastern Idaho. USGS Open File Report 99-120

[83] Smokey Canyon Mine, Panels B & C Final Supplemental Environmental Impact Statement. April, 2002.

[84] Presser, T.S., Piper, D.Z., Bird K.J., Skorupa,J.P.,Hamilton, S.J., Detwiler, S.J., and Huebner, M.A. Selenium Loading Through the Blackfoot River Watershed: Linking Sources to Ecosystems. *Life Cycle of the Phosphoria Formation. From Deposition to Post-Mining Environment* pg. 439. Edited by James R. Hein. 2004.

[85] EPA Notice of Violations, January 4, 2005, February 1, 2006, September 6, 2007 It is our understanding that another EPA NOV was issued in early 2008.

[86] Nu-West Mining, Inc. and Nu-West Industries, Inc v. United States of America, Complaint ("Compl.").

[87] Smokey Canyon Phosphate Mine Final Environmental Impact Statement. March 1982. pgs. 2-22, 2-23 J.R. Simplot Co., Caribou County, Idaho.

[88] Smoky Canyon Mine, Panels F and G Expansion Final Environmental Impact Statement. October 26, 2007, pg. 5-34 ("Beginning in 1987, for lower Pole Canyon Creek below the overburden fill, every sample collected at that site has contained selenium concentrations greater than 0.005 mg/l.").

sample of .001 mg/L taken upstream of the mine at the same time. The 1993 sampling data showed decreases in macroinvertebrate populations.[89]

Annual reports from 1994 and beyond continued to show an increasing Se problem spreading to other streams tested under the monitoring program. Water samples taken from Pole Canyon Creek in 1999 had selenium concentrations that averaged 2,350µg/L. The Pole Canyon overburden dump material subsequently polluted both Pole Canyon Creek as well as underlying groundwater in the Wells Formation aquifer with high concentrations of selenium. After ten years, this groundwater pollution also reached Hoopes Springs, located more than 2.3 miles away from the dump. The waters of Hoopes Springs and Pole Canyon Creek both carried the contamination downstream into Sage Creek, poisoning this stream as well.

Despite the data, no action was taken until 2002 after the media picked up on the extent of the selenium contamination problem at Smokey Canyon. The J.R. Simplot Company and the EPA signed an Administrative Order on Consent under CERCLA to begin an investigation. An Engineering Evaluation/Cost Analysis ("EE/CA"), based on a Site Investigation Report,[90] was completed in June 2006 The EPA approved only one of five recommendations in the EE/CA in the fall of 2006.[91]

That same month. Simplot initiated the "Pole Canyon Removal Action." This remediation effort focused on diverting Pole Canyon Creek into a pipe and routing it around the contaminated waste dump. The US Forest Service and Simplot stated in a memo: "implementation of the proposed action would have an immediate effect to reduce the release of contaminants from waste rock stored in Pole Canyon ODA." The first attempt to divert the stream was completed in the fall of 2006. However, the new pipe failed in February of 2007 spilling the creek back into the waste dump. A new diversion pipe was completed in the fall of 2007, as well as an infiltration basin at the upper end of the Pole Canyon waste dump.

In reality, and contrary to all assurances from Simplot and the agencies, a 2008 report documents that the remediation work at the Pole Canyon waste dump has not led to the desired results. The 2008 Monitoring Report for the Pole Canyon Removal Action, prepared by Simplot in October 2008, contains sampling data taken through August 2008. The report's data show that instead of *immediately lowering* selenium contamination at Pole Canyon Creek and Hoopes Springs as the agencies and Simplot claimed, pollution levels have dramatically ***increased***.

The 2008 report, including water samples data taken nine months after the installation of the Pole Canyon Creek diversion pipe and infiltration basin, shows selenium concentrations in Pole Canyon Creek where it discharges from the waste disposal area, at 5,010 µg/L in May. This is an increase of 4.018 mg/L from May 2006 when selenium concentrations were at 992 µg/L. The May 2008 concentration of 5,010 µg/L is greater than 1000 times the State standard for selenium in surface waters. The report also records selenium concentrations in water collected at Hoopes

[89] Mariah Associates Inc. Laramie, Wyoming. Aquatic Monitoring Program for Smokey Canyon Mine. 1994 results. On file at Bureau of Land Management office. Pocatello, Idaho.
[90] Site Investigation Report. Newfields, July 2005, Chapter 11, pgs. 11-15. J.R. Simplot Company.
[91] Smoky Canyon Mine CERCLA Action Memorandum. USFS. October 2006.

Spring has more than doubled between September 2006 and August 2008, from 17.4 μg/L to 35.5 μg/L. This is more than seven times the standard.

Water samples from Sage Creek were also part of the 2008 report. Sage Creek receives water from both Pole Canyon Creek and Hoopes Springs. The 2008 report documents that in May of 2008 selenium concentrations had increased more than 27% to 9.7 μg/L from September 2006 when the Sage Creek concentration was 7.0 μg/L.

Based on the 2008 data, the Forest Service has now acknowledged the substantial uncertainty regarding both the sources of the existing mine's pollution and the resulting efficacy of Simplot's limited remediation actions at Pole Canyon and Panel E.[92] In particular, the Forest Service concludes that "waste dump" seeps at the existing mine's A, D, and E panels "may reflect a significant selenium load that is infiltrating directly into [the region's] groundwater flow system."[93]

Mining companies assert that "selective handling" of the waste rock, which contains the high selenium concentrations, is "an adequate response" to the potential release of selenium to the environment.[94] However, column-leaching tests of this new process expect seepage to remain at levels of 81μg/L.[95] a level sixteen times greater than EPA's established standards to protect drinking water and aquatic life of 5μg/L. Further, ground water modeling for expansion of the Smokey Canyon mine predicts selenium contaminated "plumes," exceeding Maximum Contaminant Levels (MCLs) to extend off site "at the end of a 100 year period."[96] This "adequate response" is an illustration of how a "history of releases" is planned to continue into the distant future and impact generations of local citizens.

Smokey Canyon Mine's Pole Canyon dumpsite is only one of eight dumps at that mine, and one of many similar dumpsites in the phosphate-mining area. Clearly, phosphate mining is releasing large quantities of selenium on a continual basis into Pole Canyon Creek. The selenium continues to accumulate up the food chain and will pose increasing levels of risk as selenium concentrations rise. Oversight through TRI reporting should be provided and would aid in preventing such future occurrences throughout southeast Idaho by encouraging the phosphate mining industry to be a "better neighbor." This is especially true because surface and ground water quality sampling are still the criteria by which selenium impacts are measured when state and federal agencies consider whether to lease additional phosphate deposits.[97]

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[92] U.S. Forest Service et al., Comments on Simplot's Pole Canyon Effectiveness Monitoring Plan Revision 01. Dec. 18, 2008 at 1.

[93] *Id.*, at 4.

[94] North Rasmussen Ridge Mine Final Environmental Impact Statement. Pg 44. August 2003.

[95] Maxim Technologies Inc. Bozeman, Montana. Simplot Smokey Canyon Mine Expansion Environmental Impact Statement Column Test Report: prepared for J.R. Simplot Company 2002.

[96] Buck, Brian W., Winegar, Bruce. Integration of Surface Water Management with Mitigation of Ground Water Impacts at a Proposed Phosphate Mine Overburden Facility http://www.jbr-env.com/about/articles/BuckandWinegarPaper4.pdf

[97] North Rasmussen Ridge Mine Final Environmental Impact Statement. Appendix B. August 2003

V. Value of the Information to the Public

Requiring phosphate mines to report under the TRI program will increase available information and further the purpose of EPCRA. TRI reporting not only increases the citizenry's knowledge of toxins, but also raises awareness of health and environmental risks. This information allows the public to make more informed decisions as to where they desire to work, live, buy property, hunt, and to raise crops or livestock for human consumption. The TRI provides information that can be used by government, local communities, and others as a "yardstick" to measure progress and set goals for environmental cleanup.[98]

Many people—locally and nationwide—are particularly concerned about species protected by the Endangered Species Act ("ESA"). The phosphate mining region of southeast Idaho is home to the Canada lynx, a listed species. Additionally, at least fourteen species in the region are considered "sensitive" by state and Federal agencies, including Yellowstone cutthroat trout. Of the twelve geographic areas managed for the Yellowstone cutthroat trout, the upper Blackfoot and Salt River drainages have suffered the highest selenium concentrations.[99] This habitat degradation is one of the reasons the Yellowstone cutthroat trout had been petitioned for inclusion on the threatened list of the ESA. If phosphate mines were subject to the TRI program, concerned citizens would have more information to use in gauging the condition of these habitats over time

Much of the impacted area is within the Caribou-Targhee National Forest, where few restrictions limit where people can recreate, hunt, fish, or drink the water. As more people use the lands, and move into the area communities, the greater the health risk posed. Many counties in and bordering the Greater Yellowstone Ecosystem have a growing population rate of approximately 15%.[100] Some areas have grown at phenomenal rates. For example, Teton County, Wyoming saw a 63% growth rate between 1990 and 2000.[101] Across the state line, Teton County, Idaho grew at over 74% over the same time period.[102] Most of this growth is due to people moving into the area. These new residents are unlikely to have any knowledge of the selenium contamination danger. Updated information about selenium releases, which could be provided by TRI reporting, would raise awareness and better protect the public.

Since the livestock deaths in '96 and '97, the phosphate mining companies have not made information concerning the quantities of selenium released to the environment more available. In fact, it is just to the contrary. GYC's initial request for waste rock production information from the Bureau of Land Management ("BLM"), the permitting agency for phosphate mines, was denied. The BLM cited proprietary reasons.[103] The GYC filed a Freedom of Information Act ("FOIA") request with the Department of the Interior to obtain the amounts of waste rock produced to understand the amounts of selenium being released annually. This too was denied for alleged proprietary reasons. However, these requests revealed that the Bureau of Land

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98 61 Federal Register, 33588

99 Idaho Fish and Game.2000. Comments to the U.S. Fish and Wildlife Service regarding petition to list Yellowstone cutthroat trout as threatened under the Endangered Species Act. Boise, Idaho.

100 U.S. census figures 1990-2000. http://quickfacts.census.gov.

101 *Id.*

102 *Id.*

103 Department of Interior, Bureau of Land Management. Pocatello, Idaho. Electronic communication. 11 Oct. 2005.

Management provides little oversight of the phosphate mines. In the FOIA letter of denial, the Bureau of Land Management stated: "all mining companies treat all material mined, and not shipped for processing, as overburden and do not distinguish the difference between rock types in their reports."[104] Without stringent oversight, it seems unlikely the selenium-laden waste rock is being handled in accordance with the "Best Management Practices" required by mining permits. The difficulty for anyone to obtain information regarding selenium release information is itself a compelling reason to require phosphate mines to report under the TRI program, as this may be the only way for the public to stay informed on the amounts and dangers of selenium where they live.

The mining companies assert that the Best Management Practice (BMP) of "selective handling" adequately prevent selenium from entering the environment. However, the companies admit: "with the on-going selenium investigations . . . all the BMPs needed have not yet been identified."[105] Moreover, containment does not negate the TRI reporting requirements. The EPA has concluded that a release "does not necessarily connote direct physical contact between the toxic chemical and environmental medium. . . [and] is not required before section 313 reporting requirements are triggered."[106] This quote goes to the heart of EPCRA as it recognizes the potential for future releases. TRI reporting would allow citizens and local governments to plan for the possibility of such occurrences.

VI. The Growing Threat Caused by Continuing and Increasing Selenium Contamination

Inclusion in the TRI program is especially warranted given the continuing and increasing levels of selenium contamination in southeast Idaho from phosphate mining. Fish sampling conducted by GYC and the Idaho Department of Environmental Quality illustrates this increase. In May 2001, twenty-two fish samples were collected from nine streams in the phosphate mining area, ranging from 3.5 to15.2 μg/g Se whole fish tissue dry weight.[107] Four years later in 2005, twenty-one samples in seven streams and rivers in the same area yielded fish that all had high concentrations of selenium, ranging from 5.29 μg/g to 34.9 μg/g fish tissue, dry weight.[108] In the 2005 round of sampling, no fish could be found in Mill Creek either by GYC or the Idaho Department of Environmental Quality,[109] even though this was an historically important YCT stream.[110] This correlates with observations that "fish populations can decline or disappear over

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[104] Denial of FOIA request. 1278 (FOIA No. ID-2006-03) EFTS BLM-2006-00079. 5 Dec. 2005

[105] North Rasmussen Ridge Draft Environmental Impact Statement. Pg 2-30. March 2003.

[106] U.S. District Court for the District of Colorado. Civil Action No. 97 N 2665. 2001 U.S. Dist. Lexis 915; 51 ERC (BNA) 2104

[107] Hamilton, S. J., Buhl, K.J., May, 2001. Selenium and other trace elements in Water, Sediment, Aquatic Plants, Aquatic Invertibrates, and Fish from Streams in Southeastern Idaho Near Phosphate Mining Operations. Pg. 24.

[108] Weber, Frank. Research Triangle Institute, Research Triangle Park, NC. Technical Report. RTI Project No.:08973.002.009, Sep. 19, 2005.

[109] Verbal communication. 30 Nov., 2005. Lynn VanEvery. Richard Clegg. Idaho Department of Environmental Quality.

[110] Letter dated August 5, 1980 from Russ Thurow, Idaho Department of Fish and Game, Soda Springs, ID, to Dean Grover, Soda Springs Ranger District, Caribou National Forest. "In 1979, we electrofished sections of Kendall, Mill, and Spring Creeks. We observed densities of 20 juvenile cutthroat and 23 cutthroat trout fry per 100 meters of Kendall Creek. In Mill Creek, we surveyed two sections and densities equaled 37 cutthroat and 24 cutthroat trout fry per 100 meters with(in) the U.S. Forest Service Boundary."

the course of a few years. . . unless one is cognizant of the subtle way in which selenium operates," consistent with the Belews Lake case discussed above.[111] In the absence of fish samples, other parameters to gauge the health of Mill Creek are selenium concentrations in its water, macroinvertebrates, and macrophytes. In May 2005 water from Mill Creek had a selenium concentration of 417 μg/L,[112] the macroinvertebrate sample had a Se concentration of 43.6 μg/g, and the macrophyte sample was recorded at 77.6 μg/g.[113] In 2007, however, GYC captured one brook trout in Mill Creek. It had a whole body, dry weight selenium concentration of 37.2 μg/g.[114]

Not only is the selenium contamination problem growing, it *is escalating at an exponential rate based on all the data referenced in this petition.* Selenium is transported into the environment via water run off and infiltration. Drought conditions throughout much of the western United States has reduced traditional flows in the Blackfoot River watershed by almost 50%.[115] As a result, selenium loadings to the watershed could increase 3 to 7 times the current amount with a return to normal flows[116] Flood events will increase the risk and levels of selenium in the streams throughout the phosphate-mining region.

VII. Conclusion

The information currently available is insufficient to adequately protect the public interest. The Idaho Department of Health and Welfare's review of selenium contamination for their most recent Health Assessment was based on samples taken almost five years ago.[117] The public should have up-to-date information so that risks can be tracked from year-to-year. Furthermore, in researching the data published regarding selenium, one quickly learns that knowledge concerning the bioaccumulative nature of selenium is necessary to fully understand the impacts of this listed § 313 toxin. However, the recently released Site Investigation Report ("SIR") concerning Smokey Canyon Mine omits any discussion of bioaccumulation in all of its 819 pages.[118] This is disconcerting since that SIR was supposedly designed to address the impacts of selenium released by this mine's dump sites and to form a basis for formulating of CERCLA mitigation measures. This is also disconcerting because future CERCLA actions are currently being developed for other mine owners and will likely mimic the Smokey Canyon SIR.

Information concerning selenium will not only help citizens protect themselves but will also empower them with a measure of oversight. Additional oversight may prompt the mining

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[111] Lemly, Dennis. Selenium Impacts on Fish: An Insidious Time Bomb. Human and Ecological Risk Assessment: Vol. 5, No. 6, pp. 1139-1151 (1999)

[112] Weber, Frank. Research Triangle Institute, Research Triangle Park, NC. Technical Report. RTI Project No.:08973.002.009. May 19, 2005.

[113] Weber, Frank. Research Triangle Institute, Research Triangle Park, NC. Technical Report. RTI Project No.:08973.002.009. September 19, 2005.

[114] Weber, Frank. Research Triangle Institute, Research Triangle Park, NC. Technical Report. RTI Project No.:0208973.002.009. January 16, 2008.

[115] Presser, T.S., Hardy, M., Huebner, M.A., and LaMothe, P.J. Selenium Loading through the Blackfoot River Watershed: Linking Sources to Ecosystems. *Life Cycle of the Phosphoria Formation: From Deposition to the Post-Mining Environment.* Pg.453. Edited by James R. Hein. 2004.

[116] *Id.* at 457

[117] Idaho Department of Health and Welfare. 2005 Health Assessment of Southeast Idaho Phosphate Resource Area.

[118] Site Investigation Report, Newfields, July 2005, Smokey Canyon Mine. J.R. Simplot Company

interests to become more diligent in complying with current Clean Water Act provisions and prevent future violations of their National Pollution Elimination Discharge Permit System Multi-Sector General Permit that were noted at four separate locations by differing owners in a September 2004 inspection.[119]

The problems associated with selenium contamination in southeast Idaho and the Salt River drainage in western Wyoming have grown at an enormous rate in the past decade and, as illustrated above, are still growing. Citizens need to have access to as much information related to selenium releases as possible. The Greater Yellowstone Coalition is hopeful that the EPA will give this petition request serious and immediate consideration resulting in the promulgation of a rule to require phosphate rock mining facilities to report releases of listed § 313 toxic chemicals. Please respond in a timely manner, as required by § 555(e) of the Administrative Procedure Act.

[119] U.S. EPA Region 10. Notice of Violation and Request for Information. Sep. 13-15, 2004. MSGP tracking nos. IDR05A351, IDR05A352, IDR05A382, IDR05A469

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